

## NEMATODES FROM SOUTH AUSTRALIAN MARSUPIALS

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Some nematodes from South Australian marsupials have been dealt with in our earlier papers in the series. The present communication refers to material from the black-faced kangaroo, *Macropus melanops*, collected mainly by L. Dinning in the vicinity of Mundalla; the Flinders Range wallaby, *Petrogale xanthopus*; Pearson Island wallaby, *P. pearsoni* taken by Professor Wood Jones; Flinders Island wallaby, *Thylogale flindersi*, collected by H. H. Finlayson; and the Kangaroo Island wallaby, *Thylogale eugenii*. We have also included in our study material from *Petrogale minor* from Macdonald Downs in Central Australia, collected by the senior author. All the nematodes recorded in this paper, except *Dipetalonema roemeri* and *Austrostrongylus thylogale*, were taken from the stomach. The types of the new species have been deposited in the South Australian Museum. The present investigation has been undertaken with assistance from the Commonwealth research grant to the University of Adelaide.

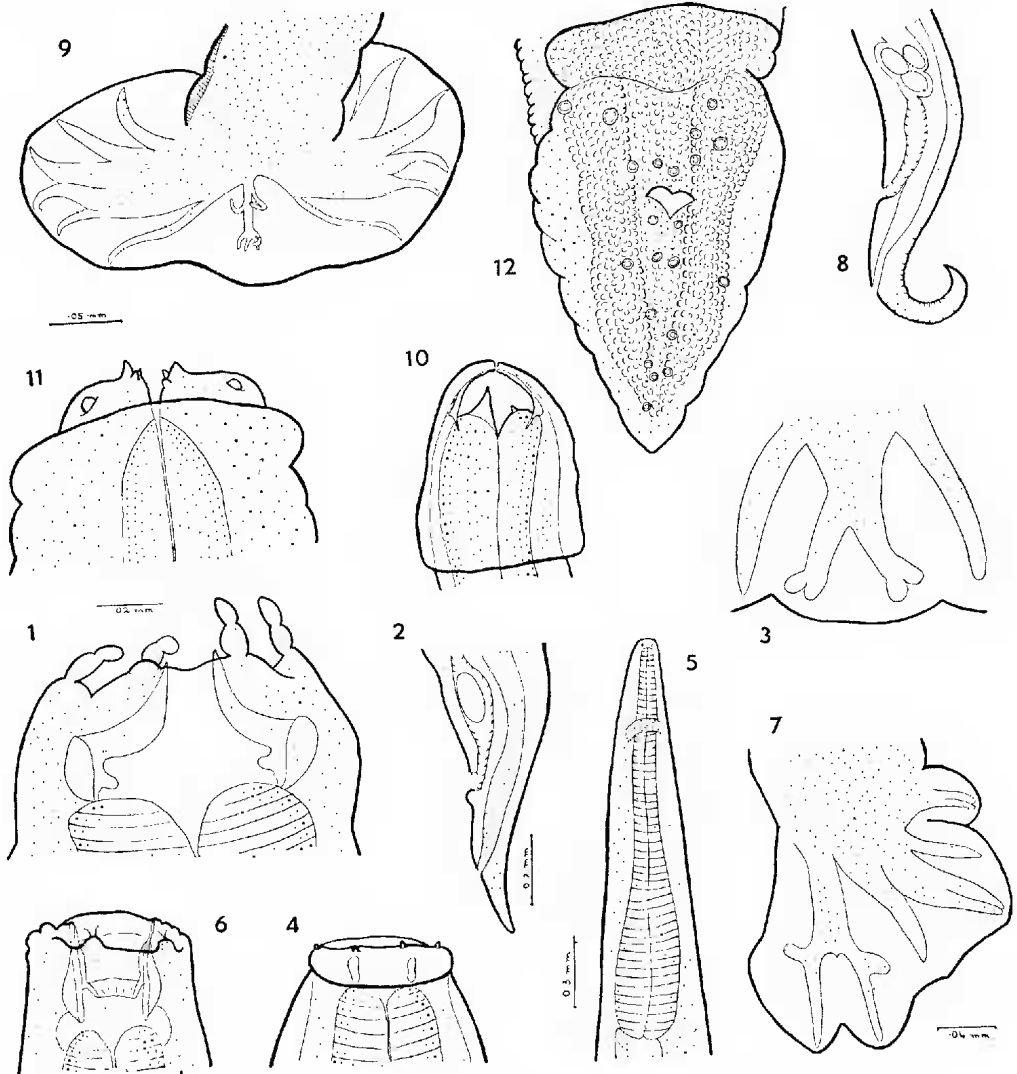
## NEMATODES RECORDED IN THIS PAPER, ARRANGED UNDER THEIR HOSTS

- Macropus melanops* Gould—*Pharyngostrongylus alpha* J. & M., *P. beta* J. & M.; *Cloacina communis* J. & M., *C. parva* J. & M., *C. curta* J. & M., *C. obtusa* J. & M., *C. macropodis* J. & M., *C. australis* J. & M., *C. frequens* J. & M., *C. vestibulata* n. sp., *C. longelabiata* J. & M., *C. hydriformis* J. & M.; *Paramacrostrongylus typicus* n. gen., n. sp.; *Dipetalonema roemeri* (Linst.).
- Macropus robustus* Gould—*Dipetalonema roemeri* (Linst.).
- Thylogale eugenii* Peron and Lessueur—*Zoniolaimus eugenii* J. & M.; *Austrostrongylus thylogale* n. sp.
- Thylogale flindersi* Wood Jones—*Pharyngostrongylus beta* J. & M.; *Cloacina macropis* J. & M.; *C. petrogale* J. & M.
- Petrogale pearsoni* Thomas—*Pharyngostrongylus alpha* J. & M.; *P. beta* J. & M.; *Cloacina petrogale* J. & M.; *Zoniolaimus longispicularis* (Wood); *Macrostrongylus pearsoni* n. sp.
- Petrogale xanthopus* Gray—*Pharyngostrongylus beta* J. & M.; *Cloacina communis* J. & M.; *C. frequens* J. & M., *C. australis* J. & M., *C. curta* J. & M., *C. longelabiata* J. & M.; *Zoniolaimus longispicularis* (Wood).
- Petrogale minor* Spencer—*Physaloptera petrogale* n. sp.

## CLOACINA Linstow

The majority of the nematodes obtained from *Macropus melanops* and *Petrogale xanthopus* belong to this genus, and we noted a similar occurrence in

*M. rufus*, *M. robustus* and *P. lateralis* from Central Australia (1938). The genus is much less commonly represented in collections of parasites from eastern Australian marsupials. Since the genus predominates in drier regions it is probable that the eggs or larvae are more resistant. Nearly all the species now recognised from South Australian hosts were described originally from Central Australia, a fact



Figs. 1-2, *Cloacina vestibulata*: 1, head, lateral; 2, posterior end, female. Figs. 3-5, *Paramacrostrongylus typicus*: 3, externo-dorsal and dorsal rays; 4, head; 5, oesophagus. Figs. 6-8, *Macrostrongylus pearsoni*: 6, head; 7, bursa; 8, posterior end, female. Figs. 9-10, *Austrostrongylus thylogale*: 9, bursa, dorsal view; 10, head, lateral. Figs. 11-12, *Physaloptera peragale*: 11, head, lateral; 12, bursa, ventral.

Figs. 1, 6, 10 to same scale; figs. 2, 8 and 12; figs. 3, 4, 9 and 11.

which is not surprising in view of the geographical and climatic continuity of the regions. The exceptions are *C. obtusa*, originally from *M. rufus* from western New South Wales, and *C. vestibulata* n. sp. Specimens of *C. petrogale* from *Petrogale pearsoni* and *Thylogale flindersi*, both insular species of wallabies, were smaller than the types but were of similar proportions. *C. macropodis*, first described from Central Australia, and later identified from eastern Queensland (1939), is now recorded from Mundalla, Flinders Ranges, and Flinders Island; it is apparently widely distributed.

The following is a list of the species and their new host records: *C. australis*, *communis*, *curta*, *frequens* and *longelabiata* from *Macropus melanops* and *Petrogale xanthopus*; *C. hydriformis*, *parva*, *obtusa* and *vestibulata* n. sp. from *M. melanops*; *C. macropodis* from *M. melanops*, *P. xanthopus* and *Thylogale flindersi*; *C. petrogale* from *P. pearsoni* and *T. flindersi*.

#### ***Cloacina vestibulata* n. sp.**

Figs 1-2

From *Macropus melanops*, Mundalla. Male unknown. Female, about 2 mm. long; characterised by a peculiar development inside buccal capsule. Six low lips; two small lateral and four large, "two-segmented" submedian papillae; leaf crown arising from about half-way up buccal ring, and below its origin a continuous narrow shelf extending into mouth cavity. Buccal ring 0.056 mm. diameter, .022 mm. deep, base .035 mm. from anterior end of lips. Oesophagus .7 mm. long, with indication of median bulb where it is surrounded by nerve ring, .3 mm. from head, before widening to its posterior end. Excretory pore and cervical papillae not observed. Posterior end narrowing near vulva to terminate in narrow pointed tail, .2 mm. long. Vagina about 1.2 mm. long; vulva .48 from tip of tail. Eggs in vagina about .16 by .08 mm.

#### PHARYNGOSTRONGYLUS Yorke & Maplestone

*P. alpha* and *P. beta* were both found in *Macropus melanops* and *Petrogale pearsoni*; but only *P. beta* in *Thylogale flindersi* and *P. xanthopus*. Both of these species have a rather longer vestibule than that figured for the type, but the differences appear to be insufficient to separate them off as new species. In *P. beta* from *Thylogale flindersi* and *P. pearsoni* the bristles on the oral papillae are bifid.

#### ZONIOLAEMUS Cobb

*Z. longispicularis* (Wood) was obtained from *P. xanthopus* and *P. pearsoni*; those taken from four specimens of the latter wallaby being much smaller than typical members of the species, but the proportions are consistent with those of Wood's species.

*Z. eugenii*, recently described by us (1940), was recognised in material from the type host species, *Thylogale eugenii*, from Kangaroo Island.

**Paramacrostrongylus** n. gen.

Trichoneminae. Long stout worms. Head with cuticular collar bearing six small papillae. Buccal ring short, cylindrical. Oesophagus widening posteriorly. Male: ventral rays parallel; externo-laterals divergent from laterals, externo-dorsal arising from base of dorsal; dorsal bifurcating about mid-length, each branch bifid at tip; spicules long, fine, with narrow striated alae. Female: tail tapering, vulva short distance in front of anus. Type, *P. typicus* n. sp. from *Macropus melanops*.

The genus resembles *Cyclostrongylus* and *Macrostrongylus* in many features, but is distinguished from both in size and in the character of the externo-dorsal and dorsal rays; and from the latter by the absence of a leaf-crown. The external appearance is suggestive of *Zoniolaimus* but it differs in the structure of the head.

**Paramacrostrongylus typicus** n. g., n. sp.

Figs. 3-5

From *Macropus melanops*, Mundalla. Female, 5.5 cm.; male, 3.6 cm. Mouth collar with six minute conical papillae; buccal ring stout, .032 mm. diameter, .02 mm. deep; oesophagus 1.8 mm. long, widening gradually after its mid-length to become twice as broad at posterior end. Nerve ring .5 mm. from anterior end.

*Male*: Bursa large, lobes not deeply separated. Ventral rays together, cleft half their length, reaching edge of bursa. Externo-lateral ray shorter than laterals, stout; medio- and postero-laterals cleft three-quarters length, postero-lateral slightly longer, none reaching bursal edge. Externo-dorsal ray arising from base of dorsal, not reaching bursal edge. Dorsal ray stout, bifurcating after half-length, each branch bifid at tip. Spicules 3.5 mm. long, 1:10 of body length. Pair of prebursal papillae. Gubernaculum absent.

*Female*: Body tapering to pointed tail, latter .35 mm. long. Vulva 1.3 mm. from posterior end; vagina very short. Eggs 150 by 70  $\mu$ .

**Macrostrongylus pearsoni** n. sp.

Figs. 6-8

From *Petrogale pearsoni*, Pearson Island, Great Australian Bight, coll. Prof. Wood Jones. Male, 5.5 mm; female, 6.2 mm. long. Anterior end flattened; with four rounded submedian and two large lateral papillae, each of the former with two setae. Buccal cavity in male .018 mm. diameter, 0.3 mm. deep, and from its walls .02 mm. from anterior end a downwardly projecting shelf composed apparently of numerous tooth-like projections.

*Male*: Spicules broken, part remaining in body .85 mm. long. Dorsal part of bursa much longer than ventral. Ventral rays parallel, cleft; externo-lateral

separate from laterals for whole length; laterals cleft half length; externo-dorsal arising with laterals, distal half divergent from them. Dorsal ray bifurcating after half length into two long thin branches; at point of bifurcation a pair of short laterals, also a very short conical median projection.

*Female*: Tail .41 mm. long, curved dorsally. Vulva .68 mm. from tip of tail. Eggs, .07-.08 by .05-.06 mm.

The species differs from any previously described in the genus in the characters of the head and buccal capsule, combined with the shape of the dorsal ray.

#### **Austrostrongylus thylogale** n. sp.

Figs 9-10

From *Thylogale eugenii*, Kangaroo Island. Small coiled worms. Males 3 mm. and females 5 mm. long. Cuticle inflated in head and neck region for .06 mm., and marked with wide transverse striations. Behind this region six longitudinal, transversely striated ridges, lateral ridges wider than submedians. Buccal capsule 15  $\mu$  deep and 25  $\mu$  wide at base; dorsal tooth 10  $\mu$  long; ventral teeth 3  $\mu$ . Oesophagus .23 mm. long, surrounded by nerve ring just behind its mid-length and .15 mm. from head. Excretory pore .19 mm. from head end.

*Male*: Spicules tapering, stout, .36 mm. long, about 1:9 of body length. Bursa large, with two large lateral lobes and a small dorsal lobe. Rays slightly asymmetrical, externo-lateral and medio-lateral of one side rather stouter than those of the other, latero-ventral more slender on the former side. Ventral and lateral rays stout near base, tapering to tips. Ventro-ventrals bending ventrally, latero-ventrals more or less straight, neither quite reaching bursal edge; externo-lateral curving ventrally, medio- and postero-laterals bending dorsally at tip, all three reaching edge of bursa. Externo-dorsals long, thin, arising from base of laterals, curving to reach bursal edge. Dorsal ray slender, short, giving off pair of rather long branches near its base, and dividing near its extremity into four short rays, the outer pair longer than the inner.

*Female*: Body tapering to conical tail. Anus .05 mm. and vulva .42 mm. from posterior end. Eggs, .06 by .03 mm. (uterine).

The species differs from the three already known in having three pairs of branches to the dorsal ray, instead of two pairs.

#### PHYSALOPTERA RID.

This genus has not been reported from kangaroos and wallabies but is common in bandicoots, occurring in the stomach. We now record a second species, the host being the rabbit bandicoot or bilby, *Peragale minor*, from Central Australia (Macdonald Downs).

. *Physaloptera peragale* n. sp.

Figs. 11-12

Large stout worms. Males about 24 mm., females up to 30 mm. long. Cuticle finely striated transversely. In the four specimens available, the cervical cuticle does not cover the lips, but is wrinkled and possibly contracted. Two lateral lips each with a pair of sublateral papillae, and each with tripartite median tooth and a larger tooth external to it. Oesophagus 5.3 mm. long (in male), anterior part narrower and surrounded about its mid-length by nerve ring .42 mm. from anterior end of head. Excretory pore .7 mm. and short, stout cervical papillae .6 mm. from head end.

*Male*: Bursa large, 1.25 mm. long, .7 mm. in maximum width at level of anus, median portion covered with longitudinal rows of bosses, lateral parts free from them. Bursal papillae irregularly arranged; three large pre-anal papillae on one side, five on the other; then one pair immediately pre-anal, two pairs post-anal; laterally from the last pair, a pair of larger papillae; and then posteriorly six papillae arranged more or less medially, the series almost reaching tip of tail. Spicules obscured, larger probably .6 mm. long.

*Female*: Tail rounded; anus .6 mm. from tip. Vulva 9.3 mm. from anterior end. Uteri full of oval eggs, 50 by 35  $\mu$ , with very thick shells and containing embryos.

The species differs from *P. peramelis* in its shorter length and in having a larger bursa with more papillae.

DIPETALONEMA ROEMERI (Linstow)

Specimens were identified from *Macropus robustus*, Flinders Ranges (coll. H. B. Holmes), and *M. melanops*, Mundalla.